REMARKS

Claims 1, 3-5, 7, 8, 11, 13, 15-20, 22-24, 26, 27, 29-31, and 38-50 are now pending in this application for which applicants seek reconsideration. Please note that claims 2, 6, 9, 12, 14, 21, 25, 28, and 32-37 were canceled during the PCT proceeding. See the Article 19 Amendment that was attached to the initial filing.

Amendment

Claims 1, 8, 17, 18, 20, 40, and 41 have been amended. Specifically, claims 17, 20, 40, and 41 have been placed in independent form, incorporating the subject matter of the parent claim and any intervening claim. Claim 8 has been amended to properly depend from amended claim 1. Claim 18 has been amended to depend from claim 17. Claim 1 has been amended to recite that the inside terminal is led outside the closing magnetic core through a through hole in one of the first and second common magnetic yokes.

New claims 42-51 have been added. New independent claim 42 is similar to independent claim 17, but further defines that the inside terminal is led outside the closing magnetic core through the entire thickness of one of the first and second common magnetic yokes. New claim 43 parallels claim 18, but depends from new claim 42. New claims 44-51 parallel claims 3-5, 7, 8, 13, 29, and 31, but depend ultimately from independent claim 17. No new matter has been introduced.

Allowable Claims

Claim 20 was indicated to be allowable if it is placed in independent form. As this claim has been placed in independent form, it is in condition for allowance.

Art Rejection

Claims 1, 3, 5, 7, 13, 29, 31, 40, and 41 were rejected under 35 U.S.C. § 103(a) as unpatentable over Fig. 47 (admitted prior art) in view of Smith (USP 5,175,525). Claim 4 was

rejected under § 103(a) further in view of Saitoh (USP 5,204,653). Claims 17-19 were rejected under § 103(a) as unpatentable over Fig. 47 in view of Smith and Mitsui (USP 4,352,080). Applicants traverse these rejections because these references would not have taught or suggested the claimed through hole configuration in one the first and second common magnetic yokes called for in independent claim 1, the notch/protrusion configuration called for in claims 17 and 42, and the claimed thickness aspect of the first and second common magnetic yokes called for in claims 40 and 41.

Independent claim 1 now calls for the inside terminal to be led outside the closing magnetic core through a through hole in one of the first and second common magnetic yokes. This feature is simply not taught by the applied references. Indeed, the examiner acknowledged that Fig. 47 does not teach leading the inside terminal to outside the closing magnetic core through a notch or a through hole. In this respect, the examiner relied upon Smith for the teaching of a notch in each of its core elements 212, 240. Smith simply fails to disclose a through hole for accommodating a terminal to the outside. Based on this structural difference, applicants submit that independent claim 1 and all claims depending therefrom patentably distinguish over the applied references.

Independent claims 17 and 42 now call for the inside terminal to be led outside the closing magnetic core through a notch in one of the first and second common magnetic yokes. Claims 17 and 42 further call for the insulating layer to include a positioning protrusion that fits into the notch. This configuration allows precise alignment of the insulating layer relative to the inside terminal and the respective common magnetic yoke. In this respect, the examiner relied upon Smith for the teaching of a notch and Mitsui for the teaching of a positioning protrusion. The examiner contends that it would have been obvious to first modify the embodiment of Fig. 47 to include the notch per the teachings of Smith, and then further modify the already modified embodiment of Fig. 47 to include the positioning protrusion per the teachings of Mitsui to facilitate manufacturing.

First, Smith does not teach a notch for leading or guiding a terminal to the outside. The leads 236, 238 of the secondary winding 230, in contrast to the examiner's understanding, do not engage or lead or guide the notch formed in the bottom ferrite core 240. This is clearly evident from Smith's Fig. 5, as well as its disclosure, which is completely silent in this regard. As reflected in Smith's Fig. 5, the inner diameter of the outer poles 244 of the bottom ferrite core 240 has approximately the same diameter as the outer diameter of the secondary winding 230. The leads 236, 238, however, are bent at a position spaced radially outwardly from the outer diameter of the secondary winding 230. The notch, on the other hand, is formed substantially contiguously with the center pole 242. As the leads 236, 238 are spaced outwardly away from the notch, the notch cannot guide or lead or engage the leads 236, 238.

Similarly, the leads 222, 224 of Smith's primary winding 220 are led to the outside at an angle then horizontally via the slanted section 228. The primary winding 220 is insetted inside the secondary winding, as illustrated in Fig. 6. See Smith, Column 6, lines 40-44. The primary winding 220 has a slanted section 233 that is complementary to the slanted section 228. The leads 222, 224 thus are not guided, led, or engaged with the notch formed at the top ferrite core 212. Accordingly, Smith would not have taught a notch through which the inside terminal is led to the outside.

Second, Mitsui does not teach a projection formed on an insulation layer.

Third, applicants submit that there would not have been any motivation to include any notch or protrusion in the embodiment of Fig. 47, and that the combination urged by the examiner is solely driven by hindsight gleaned from the present disclosure. Indeed, the embodiment of Fig. 47 does not require any positional guide since the inside terminal 5 has a stepped configuration that acts as a guide. Moreover, modifying the embodiment of Fig. 47 to incorporate the core/bobbin design of Mitsui would not have facilitated manufacturing of the device since it would have rather complicated the design and assembly. The design of Fig. 47 is quite simple, albeit the thickness problem, and one of ordinary skill in the art would not have looked toward complicating the design by adding unnecessary protrusions and notches. There

simply would not have been any motivation to include notches and protrusions in the embodiment of Fig. 47. In any event, the combination would not have taught the claimed notch and the protrusion formed in the insulating layer.

Claim 42 further calls for the inside terminal to extend completely through the thickness of the notch. Neither Mitsui nor Smith teach this feature. Accordingly, claim 42 further distinguishes over the applied combination.

Independent claims 40 and 41 call for the thickness of one of the first and second common magnetic yokes to be 60-90% of the other of the first and second common magnetic yokes. In this respect, the examiner states that the thickness of the first and second common yokes is an obvious design choice based on the desired inductance. Applicants disagree. First, the examiner provides no support for the examiner's conclusion. There is absolutely no teaching or the desirability of making one of the first and second common magnetic yokes thinner than the other. Second, the claimed ratio is designed to reduce the overall height of the device, not to achieve a desired inductance as stated by the examiner. As there is no teaching or desirability of doing what the present inventors have done, applicants submit that the applied combination would not have taught the present invention within the meaning of § 103.

As to Saitoh, this reference was relied upon for the teaching of a manganese ferrite material. Saitoh thus would not have alleviated any of the shortcomings of the other applied references as explained above.

Conclusion

Applicants submit that all of the pending claims patentably distinguish over the applied references and thus urge the examiner to issue an early Notice of Allowance. Should the examiner have any issues concerning this reply or any other outstanding issues remaining in this application, applicants urge the examiner to contact the undersigned to expedite prosecution.

ATTACHMENT

MARKED UP VERSION

IN THE CLAIMS:

Kindly replace claims 1, 8, 17, 18, 20, 40, and 41 with the following corresponding replacement claims:

--1. (Four Times Amended) A choke coil comprising:

a closing magnetic core including a first magnetic core comprising a center magnetic leg, an outer magnetic leg, and a first common magnetic yoke, and a second magnetic core comprising a second common magnetic yoke in contact with said first magnetic core;

a coreless coil including a plate-type wire comprising at least one of a flat type wire and a foil type wire, wherein said coreless coil is disposed around the center magnetic leg and separated therefrom by an insulating layer; and

inside and outside terminals respectively coupled to inside and outside ends of the plate-type wire of the coreless coil,

wherein said inside terminal is led outside said closing magnetic core through at least one of:

[a notch in the first common magnetic yoke;]

a through hole in the first common magnetic yoke; and

[a notch in the second common magnetic yoke; and]

a through hole in the second common magnetic yoke.--

--8. (Amended) The choke coil as defined in claim 1, wherein[, on a free side of said common magnetic yoke,] one of a cavity, a notch, and a hole is provided at a place corresponding to the inside terminal in the other of the first and second common magnetic yokes opposite the through hole formed in one of the first and second common magnetic yokes [situated inside of the common magnetic yoke, wherein another side of said common magnetic yoke has been provided with one of a notch and an opening].--

--17. (Twice Amended) [The] A choke coil [as defined in Claim 1,] comprising:

a closing magnetic core including a first magnetic core comprising a center magnetic leg, an outer magnetic leg, and a first common magnetic yoke, and a second magnetic core comprising a second common magnetic yoke in contact with said first magnetic core;

a coreless coil including a plate-type wire comprising at least one of a flat type wire and a foil type wire, wherein said coreless coil is disposed around the center magnetic leg and separated therefrom by an insulating layer; and

inside and outside terminals respectively coupled to inside and outside ends of the plate-type wire of the coreless coil,

wherein said inside terminal is led outside said closing magnetic core through at least one of a notch in the first common magnetic yoke and a notch in the second common magnetic yoke, and

wherein the insulating layer [comprises] includes a positioning protrusion which fits into [at least one of] the one notch [and the opening provided in the common magnetic yoke].

18. (Twice Amended) The choke coil as defined in claim 17, wherein the insulating layer comprises a terminal base.--

--20. (Three Times Amended) [The] A choke coil [as defined in Claim 19,] comprising:

a closing magnetic core including a first magnetic core comprising a center magnetic leg, an outer magnetic leg, and a first common magnetic yoke, and a second magnetic core comprising a second common magnetic yoke in contact with said first magnetic core;

a coreless coil including a plate-type wire comprising at least one of a flat type wire and a foil type wire, wherein said coreless coil is disposed around the center magnetic leg and separated therefrom by an insulating layer; and

inside and outside terminals respectively coupled to inside and outside ends of the plate-type wire of the coreless coil,

wherein said inside terminal is led outside said closing magnetic core through at least one of a notch in the first common magnetic yoke and a notch in the second common magnetic yoke, and

wherein said inside terminal is led outside said closing magnetic core through at least one of:

a notch in the first common magnetic yoke;

a through hole in the first common magnetic yoke;

a notch in the second common magnetic yoke; and

a through hole in the second common magnetic yoke,

wherein said insulating layer comprises a terminal base,

wherein said terminal base comprises a base plate and a cylinder, located in a center of the terminal base, wherein said cylinder engages with the center magnetic leg, and

wherein a thickness of a wall of said cylinder of the terminal base varies from a minimum thickness to a maximum thickness, and wherein a guiding portion is provided at the point of maximum thickness of the wall of said cylinder and the guiding portion engages with the inner terminal of the coreless coil.--

--40. (Amended) [The] A choke coil [as defined in claim 1,] comprising:

a closing magnetic core including a first magnetic core comprising a center magnetic leg, an outer magnetic leg, and a first common magnetic yoke, and a second magnetic core comprising a second common magnetic yoke in contact with said first magnetic core;

a coreless coil including a plate-type wire comprising at least one of a flat type wire and a foil type wire, wherein said coreless coil is disposed around the center magnetic leg and separated therefrom by an insulating layer; and

inside and outside terminals respectively coupled to inside and outside ends of the plate-type wire of the coreless coil,

wherein the inside terminal is led outside the closing magnetic core through at least one of [the] a notch and [the opening] a through hole provided in the first common magnetic yoke; and

wherein a thickness of the second common magnetic yoke is 65-90% [that] of a thickness of the first common magnetic yoke.

41. (Amended) [The] A choke coil [as defined in claim 1,] comprising:

a closing magnetic core including a first magnetic core comprising a center magnetic leg, an outer magnetic leg, and a first common magnetic yoke, and a second magnetic core comprising a second common magnetic yoke in contact with said first magnetic core;

a coreless coil including a plate-type wire comprising at least one of a flat type wire and a foil type wire, wherein said coreless coil is disposed around the center magnetic leg and separated therefrom by an insulating layer; and

inside and outside terminals respectively coupled to inside and outside ends of the plate-type wire of the coreless coil,

wherein the inside terminal is led outside the closing magnetic core through at least one of [the] a notch and [the opening] a through hole provided in the second common magnetic yoke; and

wherein a thickness of the first common magnetic yoke is 60-90% [that] of a thickness of the second common magnetic yoke.--